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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/626,309	07/24/2003	Philip R. LeBlanc	ADP-200 (SP03-089)	1947
22928	7590	10/19/2005	EXAMINER	
CORNING INCORPORATED			LYONS, MICHAEL A	
SP-TI-3-1			ART UNIT	
CORNING, NY 14831			PAPER NUMBER	
			2877	

DATE MAILED: 10/19/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

**Office Action Summary**

Application No.

10/626,309

Applicant(s)

LEBLANC, PHILIP R.

Examiner

Michael A. Lyons

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-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

**Period for Reply**

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

**Status**

- 1) ☒ Responsive to communication(s) filed on 24 July 2003.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

**Disposition of Claims**

- 4) ☒ Claim(s) 1-25 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-25 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

**Application Papers**

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☒ The drawing(s) filed on 24 July 2003 is/are: a) ☒ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

**Priority under 35 U.S.C. § 119**

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

**Attachment(s)**

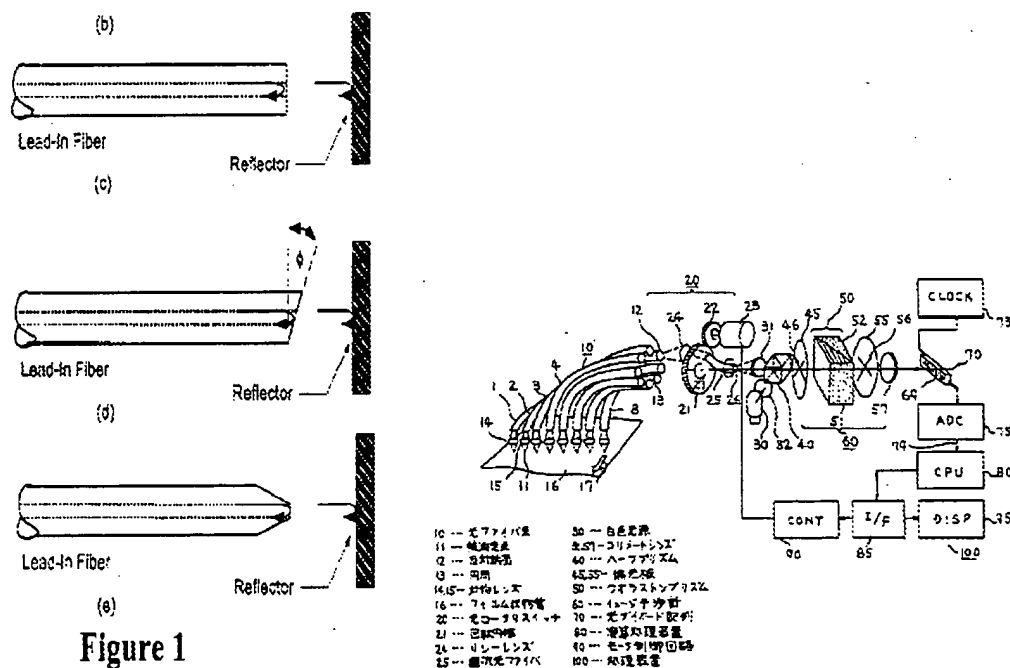
- |  |   |
|--|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)             |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>102703 and 021505</u> . | 6) <input type="checkbox"/> Other: _____  |

**DETAILED ACTION*****Claim Rejections - 35 USC § 103***

The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

**Claims 1-7 and 9-13 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasada (JP-0224204) in view of Duncan et al (6,496,265).**



**Figure 1**

Regarding claim 1, Sasada (Fig. 1) discloses an apparatus and corresponding method for inspecting a sheet of material comprising a plurality of optical fibers 1-8, each fiber having a cleaved end and being arranged in an array with a longitudinal axis, this array positioned over surface 16 so that each fiber is associated with a region of the surface, with coherent light being

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introduced into each fiber in order to make a measurement of the measurement surface, with light from each fiber being interfered and its intensity measured to determine the thickness of the surface.

Sasada fails to disclose the generation of the interference within the optical fiber and the use of the apparatus for a distance measurement between the fiber and the object to be inspected.

Duncan (Figs. 1c-1e), however, discloses a fiber optic sensor where light enters the fiber, is partially reflected at the cleaved end of the fiber, with the remainder of the light beam being transmitted through the fiber, reflecting off the surface to be measured, and re-entering the fiber, leading to interference between the reference and measurement beams due to the optical path difference of the beams, this interference allowing for a distance measurement to be obtained between the endface of the fiber and the object to be inspected.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the fiber arrangement of Duncan in the fiber array of Sasada, the motivation being that the Duncan arrangement will allow for precise distance measurements with the interference occurring in the fiber while allowing for thickness and other measurements to be taken as well, since "the fiber optic distance measurement technique can be applied to a variety of sensor types, including, but not limited to, pressure, displacement, temperature, acoustic, pressure, load, and magnetic field sensors" (Duncan abstract).

As for claims 2 and 3, the combined invention discloses the amount of light that can transmit through the fiber to be used for the measurement beam as being 96% (Duncan column 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made, however, to limit the transmitted light to less than either 10% (claim2) or 5% (claim

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3), since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

As for claim 4, the fiber array of Sasada is arranged in a single row.

As for claim 5, the fiber array of Sasada is only in a single row, not in a double, staggered pair of rows. It would have been obvious, however, to one having ordinary skill in the art at the time the invention was made to add a second, staggered row of fibers to the array of Sasada, the motivation being that the second row will allow for more instantaneous coverage of the object under inspection during a single measurement. It has also been held that the mere duplication of the essential working parts of a device involves only routine skill in the art. *St. Regis Paper Co. v. Bemis Co.*, 193 USPQ 8.

As for claim 6, the combined invention discloses the fibers being adjacent to each other but fails to explicitly disclose the use of fibers with a core and a cladding. However, a fiber's inherent construction consists of a core protected by a cladding, and it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a fiber with a core and cladding, the motivation being that the cladding protects the core of the fiber and prevents light from unnecessarily escaping the fiber, maintaining an optimum amount of light for use in measurements.

As for claim 7, Fig. 1e of Duncan shows the use of tapered fibers.

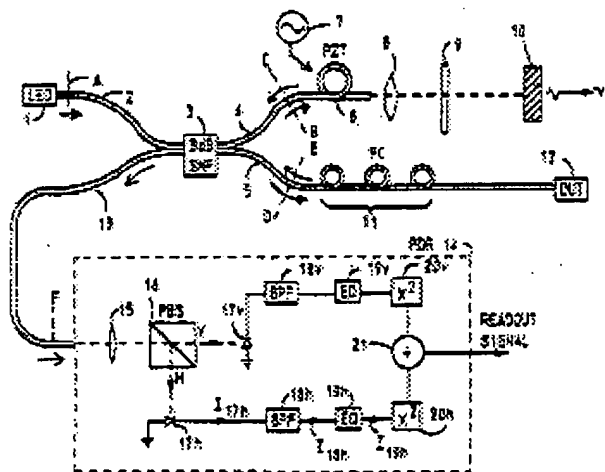
As for claims 9-12, the combined invention fails to disclose the repositioning of the array to make additional measurements of other portions of the surface after the initial measurement. It would have been obvious, though, to one having ordinary skill in the art at the time the

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invention was made to adjust the fiber array either perpendicularly or parallel to the longitudinal axis of the surface, this adjustment being indicated by feedback generated by the initial measurement, since it has been held that the provision of adjustability, where needed, involves only routine skill in the art. *In re Stevens*, 101 USPQ 284 (CCPA 1954).

As for claim 13, the combined invention fails to disclose the use of a glass sheet as the object to be inspected. Replacing a generic surface with a glass sheet is a matter of intended use, and it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a glass sheet as the object to be inspected in the combined device, the motivation being that distance measurement only relies on the distance between the fiber and the surface of the object to be measured with no internal reflection in the object; any surface, including glass, can be used in the distance measurement.

**Claim 8 is rejected under 35 U.S.C. 103(a) as being unpatentable over Sasada (JP-02242104) in view of Duncan et al (6,496,265) and in further view of Sorin et al (5,202,745).**



As for claim 8, the combination of Sasada and Duncan discloses the claimed invention above as regarding claim 1, but fails to disclose the splitting of the interfered light beam into

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orthogonally polarized components, individually detecting these components, and using the components to determine a property of the object under inspection.

Sorin (Fig. 1), however, discloses a fiber interferometer where, after the light beam reflecting off the surface to be measured 12 and is interfered with the reference, is split at polarizing beam splitter 16, with the vertical polarization going to photodetector 17v and the horizontal polarization going to photodetector 17h.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a polarizing beam splitter to the combined device of Sasada and Duncan as per Sorin, the motivation being that the polarization splitting of the interference light will allow for polarization-specific measurement of defects on the surface of the object to be inspected.

**Claims 14-19 are rejected under 35 U.S.C. 103(a) as being unpatentable over Sasada (JP-02242104) in view of Duncan et al (6,496,265) and in further view of Sorin et al (5,202,745).**

Regarding claim 14, the combination of Sasada and Duncan discloses the claimed invention above as regarding claim 1, but fails to disclose the splitting of the interfered light beam into orthogonally polarized components, individually detecting these components, and using the components to determine a property of the object under inspection.

Sorin (Fig. 1), however, discloses a fiber interferometer where, after the light beam reflecting off the surface to be measured 12 and is interfered with the reference, is split at polarizing beam splitter 16, with the vertical polarization going to photodetector 17v and the horizontal polarization going to photodetector 17h.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a polarizing beam splitter to the combined device of Sasada and Duncan as per Sorin, the motivation being that the polarization splitting of the interference light will allow for polarization-specific measurement of defects on the surface of the object to be inspected.

As for claim 15, the combined invention discloses the amount of light that can transmit through the fiber to be used for the measurement beam as being 96% (Duncan column 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made, however, to limit the transmitted light to less than 5%, since it has been held that where the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

As for claims 16-18, the combined invention fails to disclose the explicit defect detection as claimed. Using the fiber array to as defect detection is a matter of intended use, and it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the combined invention for defect detection, the motivation being that “the fiber optic distance measurement technique can be applied to a variety of sensor types, including, but not limited to, pressure, displacement, temperature, acoustic, pressure, load, and magnetic field sensors” (Duncan abstract).

As for claim 19, the combined invention fails to disclose the use of a glass sheet as the object to be inspected. Replacing a generic surface with a glass sheet is a matter of intended use, and it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a glass sheet as the object to be inspected in the combined device, the



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motivation being that surface defect measurement only relies on the reflection of light off the surface of the object to be measured with no internal reflection in the object; any surface, including glass, can be used in such a measurement.

**Claims 20-25 are rejected under 35 U.S.C. 103(a) as being unpatentable over Duncan et al (6,496,264) in view of Sorin et al (5,202,745).**

Regarding claim 20, Duncan discloses the single-fiber arrangement of the claimed invention above as regarding claim 1, but fails to disclose the splitting of the interfered light beam into orthogonally polarized components, individually detecting these components, and using the components to determine a property of the object under inspection.

Sorin (Fig. 1), however, discloses a fiber interferometer where, after the light beam reflecting off the surface to be measured 12 and is interfered with the reference, is split at polarizing beam splitter 16, with the vertical polarization going to photodetector 17v and the horizontal polarization going to photodetector 17h.

Therefore, it would have been obvious to one having ordinary skill in the art at the time the invention was made to add a polarizing beam splitter to the combined device of Sasada and Duncan as per Sorin, the motivation being that the polarization splitting of the interference light will allow for polarization-specific measurement of defects on the surface of the object to be inspected.

As for claim 21, the combined invention discloses the amount of light that can transmit through the fiber to be used for the measurement beam as being 96% (Duncan column 1). It would have been obvious to one having ordinary skill in the art at the time the invention was made, however, to limit the transmitted light to less than 5%, since it has been held that where

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the general conditions of a claim are disclosed in the prior art, discovering the optimum or working ranges involves only routine skill in the art. *In re Aller*, 105 USPQ 233.

As for claims 22-24, the combined invention fails to disclose the explicit defect detection as claimed. Using the fiber array to as defect detection is a matter of intended use, and it would have been obvious to one having ordinary skill in the art at the time the invention was made to use the combined invention for defect detection, the motivation being that “the fiber optic distance measurement technique can be applied to a variety of sensor types, including, but not limited to, pressure, displacement, temperature, acoustic, pressure, load, and magnetic field sensors” (Duncan abstract).

As for claim 25, the combined invention fails to disclose the use of a glass sheet as the object to be inspected. Replacing a generic surface with a glass sheet is a matter of intended use, and it would have been obvious to one having ordinary skill in the art at the time the invention was made to use a glass sheet as the object to be inspected in the combined device, the motivation being that surface defect measurement only relies on the reflection of light off the surface of the object to be measured with no internal reflection in the object; any surface, including glass, can be used in such a measurement.

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Michael A. Lyons whose telephone number is 571-272-2420. The examiner can normally be reached on Monday through Friday.

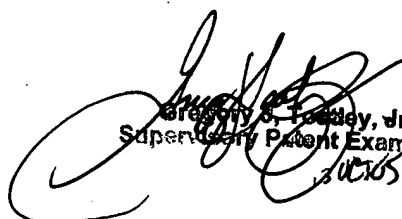
If attempts to reach the examiner by telephone are unsuccessful, the examiner’s supervisor, Gregory J. Toatley can be reached on 571-272-2800 ext. 77. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

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Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

MAL

October 6, 2005

  
Gregory S. Puckey, Jr.  
Supervisory Patent Examiner  
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